Wh-Copying, Phases, and Successive Cyclicity

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Revised Version, March 2003

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Abstract

This paper re-examines the wh-copying phenomenon that is attested in a number of languages including German, Frisian, Afrikaans, and Romani, in the context of Chomsky's (1998, and later) phase-based approach to syntactic derivation. Wh-copying is traditionally thought to provide strong evidence for the successive-cyclic nature of wh-movement. Besides the more general problem of how intermediate movement steps are formally triggered, however, the wh-copying phenomenon raises the questions of what grammatical condition or conditions should permit (or possibly, force) the phonetic realisation of intermediate wh-copies, why the spelling-out of locally uninterpretable copies of a wh-operator does not cause the derivation to crash at the phase level, and to what extent their presence poses a problem for the principle of Full Interpretation and for Kayne's (1994) Linear Correspondence Axiom. It is shown that an analysis of wh-copying in terms of the discontinuous spelling-out of a wh-expression's 'operator' and 'core' parts, in conjunction with a convergence-based view of phases, not only helps provide answers to the above questions, but also accounts for some otherwise difficult-to-explain restrictions on wh-copying.

Keywords: Wh-movement; Interrogatives; Syntax; Successive-cyclicity; Phases; German
1. Introduction

The idea that long wh-movement proceeds in a series of local steps has for a long time been a core assumption of generative-transformational theory, and is supported by a large body of empirical evidence from a variety of sources. Many languages exhibit morphophonological reflexes of successive-cyclic wh-raising such as wh-agreement in Irish (McCloskey, 2000a, 2000b, 2001) and Chamorro (Chung, 1982, 1994), deletion of the verbal prefix men- in Malay/Bahasa Indonesia (Cole & Hermon, 2000; Saddy, 1991), or tonal downstep in Kikuyu (Clements et al., 1983; Sabel, 2000). Developmental evidence in favour of cyclic wh-movement includes children's use of 'medial wh' in long-distance questions such as Who do you think who's in the box? (De Villiers et al., 1990; McDaniel et al., 1995, Thornton, 1990). The wh-copying strategy of asking long wh-questions is also attested in the adult speech in a number of languages including present-day German, Frisian, Afrikaans, and Romani (see e.g. Du Plessis, 1977; Hiemstra, 1986; Höhle, 2000; McDaniel, 1986; Reis, 2000):

(1) a. Wen glaubst Du, wen sie getroffen hat? German
   who think you who she met has
   'Who do you think she has met?'

   b. Wêr tinke jo wêr't Jan wennet? Frisian
      where think you where that-CL J. resides
      'Where do you think that John lives?'

(Hiemstra, 1986: 99)
The lower *wh*-pronouns in (1a-d) are commonly assumed to be spelled-out 'intermediate traces' of successive-cyclic *wh*-movement.

While the cross-linguistic evidence in favour of successive-cyclicity seems rather persuasive, the idea that all syntactic movement must result in feature-checking (Chomsky, 1995, and later) has given rise to the question of how intermediate steps in A'-movement are formally triggered. Possible solutions to this problem range from the proposal that movement-triggering features can optionally be added to subordinate functional heads (Chomsky, 1998) to the suggestion that long *wh*-movement does in fact take place in a single step, with apparent morphophonological reflexes of intermediate movement steps being reinterpreted as reflexes of an abstract agreement relation (Radford, 2001). Besides the triggering problem, which poses a problem for cyclic movement in general, the *wh*-copying phenomenon raises the following more specific questions:
• What grammatical property or properties of wh-copying languages permit the spelling-out of intermediate wh-copies?

• If intermediate wh-copies are merely spelled-out traces of successive-cyclic movement, then why is wh-copying more restricted than long-distance wh-extraction?

• On the assumption that the spelling-out of a [wh] feature is contingent upon feature-checking (or feature agreement), how is it possible for an interrogative wh-expression to be spelled out in the specifier of a non-interrogative C head?

• To what extent does the phonetic realisation of multiple copies of the same wh-operator pose a problem for the principle of Full Interpretation, which requires all uninterpretable features to be eliminated prior to Spellout, and for Kayne's (1994) Linear Correspondence Axiom (LCA), which assumes a one-to-one mapping between hierarchical syntactic structure and linear word order?

This article is structured as follows. After drawing attention to some theoretical problems arising from Chomsky's phase-based approach to syntactic derivation in section 2, I examine the wh-copying construction in detail in section 3, focussing on German. As an alternative to previous accounts, I propose that wh-copying reflects the discontinuous spelling-out of a wh-expression's 'operator' part and its restriction or 'core' part, which is argued to be essentially analogous to other forms of quantifier-splitting typically found in languages such as German that permit the use of the copying strategy. I show that the proposed analysis manages to avoid the theoretical problems noted above, and moreover helps account for the fact that wh-copying is restricted in certain ways that ordinary long-distance extraction is not. The finding that wh-copying is indeed contingent upon successive-cyclic movement is argued to support a
convergence-based view of 'phase', but leaves open the answer to the triggering problem. Some possible solutions to the latter will be discussed in section 4, and the main observations and conclusions of this article are summarised again in section 5.

2. Theoretical preliminaries

Within the minimalist framework outlined by Chomsky (1998/2000, and later), the derivation proceeds 'by phase', that is, syntactic structures are built in a bottom-up, one-phase-at-a-time fashion. Phases, which according to Chomsky include the 'propositional' categories CP and (transitive) vP, can thus be seen as defining local computational domains. Phases are constructed by successive application of the two basic structure-building operations Merge and Move. Overt movement, which presupposes abstract agreement, is induced only by heads that carry an EPP feature. Agreement - and hence, movement - is triggered by the need to eliminate uninterpretable features of both the attracting head (the probe) and the attractee (the goal). In Chomsky's (2001a) terminology, uninterpretable features are actually unvalued features that need to be assigned a PF-value through agreement, which then allows for them to be deleted from the representation. The operation Spellout applies cyclically in that each phase is 'spelled out' - that is, is passed on to the phonological and semantic systems for evaluation and interpretation - at the point at which the next higher phase is completed (Chomsky, 2001a: 13). The idea that phases constitute relatively independent units of computation is captured by the Phase Impenetrability Condition (PIC):
(2) \textit{Phase Impenetrability Condition}:

In phase $\alpha$ with Head H, the domain of H is not accessible to operations outside $\alpha$, only H and its edge are accessible to such operations.

(Chomsky, 2000: 108)

That is, once a phase has undergone Spellout, all elements contained within it, with the exception of the head and its specifier(s), become inaccessible to further syntactic operations. A derivation will crash (at the phase level) if one or more elements within a phase undergoing Spellout still contain any uninterpretable features. The assumption that derivations proceed by phase serves to reduce 'operative complexity' in that for each derivational cycle, only a subarray of lexical items including a single C or $ν$ only needs to be drawn from the lexicon and held in active memory (Chomsky, 2000: 106).

Several authors have noted, however, that a phase-based approach to syntactic derivation, in conjunction with the assumption that movement can only be triggered by the need to eliminate uninterpretable features of the attracting head (the \textit{Last Resort} condition; Chomsky, 1995: 280), raises new questions about the nature of, and motivation for, successive-cyclic movement (compare, among others, Atkinson, 2000; Heck & Müller, 2000; McCloskey, 2000a; Radford, 2001). Consider long $\textit{wh}$-raising, the prototypical case of an unbounded dependency.

According to Chomsky (2000), $\textit{wh}$-expressions carry both an uninterpretable [wh] feature that renders them 'active', i.e., available for movement, and an interpretable operator feature [Q]. In $\textit{wh}$-raising languages such as English, interrogative C - in addition to an uninterpretable [Q] feature that must be eliminated through agreement - contains an EPP feature that triggers overt movement of the closest available $\textit{wh}$-expression. The uninterpretable [wh] feature carried by the
latter will be checked, or valued, under Q-agreement. For long \(wh\)-raising structures such as (3a) below, Chomsky assumes that the \(wh\)-expression moves through the edge of each intervening phase before finally reaching its ultimate landing site, the specifier of the matrix C, where it will also be pronounced (the prefix \(u\) indicates that a feature is uninterpretable).

(3) a. Who did you say (that) Mary likes?

b. \[
\begin{array}{l}
[\text{CP}_2 \text{ WHO} \quad [C \text{ did }] \quad \text{you} \quad [vP_2 \text{ who} \quad [v \text{ say} ]]
\end{array}
\]
\[
\begin{array}{l}
[u\text{wh},Q] \quad [\text{EPP},uQ] \quad [u\text{wh},Q]
\end{array}
\]
\[
\begin{array}{l}
[CP_1 \text{ who} \quad [C (that)] \quad \text{Mary} \quad [vP_1 \text{ who} \quad [v \text{ likes} \quad \text{who} ])]
\end{array}
\]
\[
\begin{array}{l}
[u\text{wh},Q] \quad [u\text{wh},Q] \quad [u\text{wh},Q]
\end{array}
\]

Given the Phase Impenetrability Condition (2), successive-cyclic movement through the edge of intervening phases is necessary to ensure that the \(wh\)-expression remains accessible to further syntactic operations once the remainder of the phase containing it has undergone Spellout.

A question that immediately arises here, though, is how movement to intermediate positions should be triggered given that both \(v\) and declarative C are, presumably, unable to check the uninterpretable \([wh]\) feature of the moved \(wh\)-expression. Indeed, if they did, the \(wh\)-expression would no longer be active, thus leaving the uninterpretable \([Q]\) feature of the matrix C unchecked. The \textit{Triggering Problem} is stated informally in (4).
(4) *The Triggering Problem:*

On the assumption that agreement (and hence, movement) is triggered by matching but uninterpretable features of the probe, what triggers movement of a *wh*-expression to the specifier of intermediate non-interrogative heads?

A second potential problem with the derivation sketched in (3b) arises from the assumption that Spellout applies automatically to phases at the next phase level up (compare also Atkinson, 2000). Note that at the point at which vP1 undergoes Spellout (i.e., upon completion of the next higher phase, CP1), the copy of the moved *wh*-expression in (Spec,vP1) still contains an uninterpretable [wh] feature. This will not be a problem at this stage in the derivation if, as Chomsky suggests, material at the edge of a phase PH\textsubscript{n} can escape Spellout in the sense that it remains 'visible' to probing heads within the next higher phase PH\textsubscript{n+1}. However, on the assumption that no lookahead is possible beyond PH\textsubscript{n+1}, it is unclear why, at the point at which PH\textsubscript{n+1} is spelled out (i.e., upon completion of PH\textsubscript{n+2}) the presence at the edge of PH\textsubscript{n} of a copy of a *wh*-item still carrying an uninterpretable [wh] feature does not cause the derivation to crash. Let us refer to this problem - which in fact occurs whenever successive-cyclic *wh*-movement needs to cross more than one phase boundary - as the *Convergence Problem* (5).

(5) *The Convergence Problem:*

If phases undergo cyclic Spellout at the next higher phase level, then why does the spelling-out of phases containing a (covert or overt) copy of a *wh*-item that is still active at the point of Spellout not cause the derivation to crash prior to its completion?
Atkinson (2000) notes that this problem would disappear if phases were defined on the basis of convergence rather than extensionally. If only constituents that are convergent - that is, constituents that no longer contain any uninterpretable features - can undergo Spellout, then it will not be until the matrix CP (= CP2) in (3b) has been completed that anything at all is sent to the interfaces.²

Elaborating further the idea that certain syntactic operations may apply non-locally, Radford (2001: 37) suggests that both the convergence problem and the triggering problem could be overcome at the same time if it were assumed that rather than creating a trail of phonetically null copies, long wh-raising takes place in a single step.³ While many of the data traditionally cited in support of successive-cyclic wh-movement may indeed be reanalysable without recourse to intermediate movement steps, as has been argued by Radford (2001), the presence of identical PF-copies of a moved wh-expression at intermediate positions in the adult language would seem to present a serious challenge for the single-step hypothesis. Or does it? Possible alternative analyses of wh-copying in terms wh-complementiser agreement or head-adjunction might offer a way of reconciling the wh-copying phenomenon with the idea of acyclic wh-movement. I will show below, however, that neither of these two alternative approaches to wh-copying turns out to be empirically tenable. What is more, there is evidence that rather than being semantically invisible, intermediate copies may actually contribute to a sentence's interpretation.
3. **Wh-copying in German**

3.1 **Preliminary observations**

Many (colloquial) varieties of present-day German permit the use of the *wh*-copying strategy, which is exemplified by (6a-c) below (examples from Fanselow & Mahajan, 2000: 220).

(6)  

a. *Wie* glaubst du, *wie* sie das gelöst hat?  
    how believe you how she that solved has  
    'How do you believe that she has solved that?'

b. *Warum* glaubst du, *warum* sie das getan hat?  
    why believe you why she that done has  
    'Why do you believe she has done this?'

c. *Wovon* glaubst du, *wovon* sie träumt?  
    of.what believe you of.what she dreams  
    'What do you believe that she dreams of?'

Observe that while for many speakers, the copy construction seems to be the preferred way of asking long *wh*-questions, sentences involving *wh*-copying usually have a long-distance extraction counterpart.\(^4\)
(7) a. Wie glaubst du, dass sie das gelöst hat?
   how believe you that she that solved has
   'How do you believe that she has solved that?'

   b. Warum glaubst du, dass sie das getan hat?
   why believe you that she that done has
   'Why do you believe that she has done this?'

   c. Wovon glaubst du, dass sie träumt?
   of.what believe you that she dreams
   'What do you believe that she dreams of?'

Wh-copying is possible only with verbs that permit long wh-extraction from a finite complement clause (so-called 'bridge' verbs) and which select a non-interrogative complement clause. Verbs selecting interrogative complements such as *fragen* 'ask', on the other hand, do not license the copy construction (cf. [8c]).

(8) a. Du fragst/*glaubst, wovon sie träumt.
   you ask / believe of.what she dreams

   b. Wovon glaubst /*fragst du, dass sie träumt?
   of.what believe / ask you that she dreams
c. \textit{Wovon} glaubst /*fragst du, \textit{wovon} sie träumt? \\
of what believe / ask you of what she dreams

Not all speakers of German accept the copy construction, but as Höhle (2000: 257n.7) observes, its use is not obviously linked to any particular dialect areas, either. In standard varieties of German, the \textit{wh}-copying strategy appears to be restricted to pronominal \textit{wh}-expressions. That is, most of the speakers who accept sentences like (8a-c) above do not accept \textit{wh}-copying structures that involve full \textit{wh}-phrases. The examples below, for instance, are judged to be ill-formed by Fanselow & Mahajan (2000) - although they note that speakers' judgements tend to be less consistent for examples like (9b) that involve a prepositional \textit{wh}-phrase (which I have indicated here by the symbol \%).

(9) a. * \textit{Welchen Mann} glaubst du, \textit{welchen Mann} sie liebt? \\
which man believe you which man she loves  \\
'Which man do you believe that she loves?'

b. \% \textit{An wen} glaubst du, \textit{an wen} sie denkt? \\
of whom believe you of whom she thinks  \\
'Who do you believe that she thinks of?'

In Afrikaans, \textit{wh}-copying of prepositional phrases appears to be fully acceptable, provided that the complement of the preposition is pronominal (Du Plessis, 1977: 725).
According to Fanselow & Mahajan (2000), *wh*-copying is phonologically constrained in that only *wh*-phrases that are single morphophonological words can normally be spelled out at intermediate positions. Given the acceptability of sentences like (10) in Afrikaans, and the controversial status of examples such as (9b) in German, however, a possible alternative generalisation might be that the copy strategy is unavailable for referential or D-linked *wh*-expressions (in the sense of Pesetsky, 1987). I shall return to this issue in section 3.4 below.

Observe further that *wh*-copies are licensed only at derived positions but not in situ (cf. [11a]), and that in the absence of an overt complementiser, a copy must appear at the left periphery of the embedded clause (cf. [11b]).

Finally, note that in *wh*-copying structures that involve multiple embedding, each intervening clause must be introduced by a separate *wh*-copy (compare Reis, 2000: 395):
(12) *Wen glaubst du, *dass Peter meint, *wen Susi heiratet?

who believe you who / *that P. thinks who S. marries

'Who do you believe Peter thinks that Susi is marrying?'

If the lower *wh-items in *wh-copying sentences prove to be 'real' in the sense that they represent phonetically realised intermediate traces of a moved *wh-expression higher up in the sentence, thus reflecting earlier stages in the derivation, then *wh-copying would indeed provide strong evidence for successive-cyclicity.

3.2 Wh-copying versus partial movement

The copy construction has often been treated on a par with the so-called 'scope marking' or partial movement construction, in which the expletive *wh-pronoun was 'what' - rather than a copy of a contentful *wh-phrase - occupies the (Spec,CP) position of the matrix clause, as in (13).

(13) *Was glaubst du, *wovon sie träumt?

what believe you of what she dreams

The fact that the copy construction shares several of the properties of the partial movement construction has led many scholars to conclude that the two are variants of each other, both of which represent special instances of long-distance *wh-movement (compare e.g. Bayer, 1996; Höhle, 2000). This assumption is called into question, however, by the observation that the copy construction and the partial movement construction fail to pattern alike in several respects. They differ, for example, with respect to the possibility of conjoining two (or more) embedded clauses
(Dayal, 2000; Höhle, 2000), and the acceptability of the verb *scheinen* 'seem' and of direct object 
DPs in the matrix clause (Höhle, 2000; Reis, 2000, among others). For illustration, consider the 
pairs of examples in (14)-(16) below.

(14)  
a.  
Es ist egal,  *was* er meint, [CP *wann* sie kommt] und [CP *wen* sie mitbringt] 
it is no.difference what he thinks when she comes and who she brings

b.  * Es ist egal,  *wann/wen* er meint, [CP *wann* sie kommt] und [CP *wen* sie mitbringt] 
it is no.difference when/who he thinks when she comes and who she brings

(15)  
a.  *Was* scheint es, *wen* Hans geschlagen hat? 
what seems it who H. hit has
b. * Wen scheint es, wen Hans geschlagen hat?
   who seems it who H. hit has

(16) a. * Was hat Peter das Gefühl, wen man fragen könnte?
   what has P. the feeling who one ask could

b. ? Wen hat Peter das Gefühl, wen man fragen könnte?
   who has P. the feeling who one ask could

'Who does Peter feel that one could ask?'

The grammaticality of (14a) provides evidence against the assumption that was and (either of) the embedded contentful wh-expressions are part of the same syntactic chain, as LF-movement of wann or wen would render the sentence ill-formed on a par with (14b). Examples (15a) and (16a) illustrate Reis' (2000) observation that partial movement is licensed only by matrix predicates that also admit DP complements. The corresponding wh-copying sentences, on the other hand, pattern with long-distance wh-questions in that they also occur with predicates that select clausal complements only.

Observe further that in contrast to the copy construction, the partial movement construction freely permits full wh-phrases to appear at intermediate positions:
(17) Was glaubst du, welchen Mann sie liebt?

what believe you which man she loves

'Which man do you believe that she loves?'

Many speakers of German moreover accept dass clauses intervening between was and the lower wh-phrase, which indicates that contrary to what we find in the copy construction (cf. [12] above), the lower wh-phrase need not be strictly subjacent to the higher one (compare e.g. Fanselow & Mahajan, 2000; Höhle, 2000; Reis, 2000):

(18) %Was glaubst du, dass Peter sagt, wen Maria getroffen hat?

what think you that P. says who M. met has

'Who do you think that Peter says Mary has met?'

Taken together, the above observations suggest that we are in fact dealing with two different types of construction here. Specifically, there is evidence that the 'scope marker' was in the partial movement construction originates in matrix object position (hence its incompatibility with predicates selecting clausal complements only), and that it does not enter into any kind of direct dependency relationship with the contentful wh-expression in the lower clause at all (cf. [14a]). Felser (2001) recently proposed an 'indirect dependency' analysis of the partial movement construction (in the spirit of Dayal, 1994) according to which was is a CP-proform and argumental, and the embedded wh-clause a secondary predicate. An analysis along these lines is further supported by certain 'scope freezing' facts observed by Pafel (2000) and Lahiri (2002), and by the following contrast noted by Hinrichs & Nakazawa (2001) (my translations):7
   'I checked what Hans says as to whom he suspects.'

   'I checked the person who Hans says he suspects.'

If \textit{was} 'what' in (19a) above were indeed a placeholder for \textit{wen} 'who', then the resumptive pronoun should be \textit{den} 'him' rather than \textit{das} 'that', as in the \textit{wh}-copying example in (19b).

Under the indirect dependency view, multi-clausal interrogatives that contain more than one instance of the 'scope marker' \textit{was} are assumed to involve several local chains rather than successive-cyclic movement, or \textit{wh}-copying, as indicated in (21) below (compare Felser, 2001: 30f.).

(20) \textit{Was} glaubst du, \textit{was} Susi denkt, \textit{wovon} Maria träumt?
   'What do you think Susi thinks Maria dreams of?'

(21) \begin{align*}
    \psi_{\text{CP3}} & \text{Was} \text{$_i$} \text{glaubst du} \quad t_i \ldots \psi_{\text{CP2}} \text{was} \text{$_j$} \text{Susi} \ldots \text{t} \text{$_j$} \text{denkt} \psi_{\text{CP1}} \text{wovon} \text{$_k$} \text{Maria} \quad \text{t} \text{$_k$} \text{träumt}\end{align*}
In short, the partial movement construction appears to differ from the copy construction in that only the latter necessarily involves *wh*-dependencies spanning two or more clauses, or the spelling-out of several copies of the same *wh*-item. If the analysis sketched above is along the right lines, then the partial movement construction does not in fact present any problems for a phase-based theory of derivation, beyond those presented by *wh*-movement in general. Hence in what follows, our discussion will focus exclusively on the *wh*-copying phenomenon.8

3.3 Are intermediate copies real?

As was noted in the introduction, the *wh*-copying phenomenon raises the questions of why the spelling-out of locally uninterpretable *wh*-copies does not cause the derivation to fail before it is completed, and to what extent multiple PF occurrences of *wh*-expressions present a problem for the LCA, which maps hierarchical into linear order. Both of these problems could be avoided if it could be shown that intermediate *wh*-items are not what they appear to be (i.e., spelled-out traces of successive-cyclic movement). Let us therefore examine the possibility that *wh*-copying does not involve multiple PF-occurrences of moved *wh*-expressions at all, but instead represents a special case of complementiser agreement, analogous to *wh*-agreement in Irish. In Irish, the complementiser *go* that normally introduces finite complement clauses (cf. [22a] below) is replaced by *aL* in clauses out of which operator movement has taken place as in (22b).

(22) a. Creidim gu-r inis sé bréag.
    I-believe *go*-PAST tell he lie
    'I believe that he told a lie.'
b. an t-ainm a hinnseadh dúinn a bhí ar an áit
the name *aL was-told to-us aL was on the place
'the name that we were told was on the place'

(McCloskey, 2000a: 4f.)

An analysis of *wh*-copying in terms of complementiser agreement has been proposed by Thornton & Crain (1995) for children's medial *wh*-sentences. Under this view, the intermediate 'copy' is actually a complementiser that agrees with a long-distance moved *wh*-expression to the point of phonetic identity.

(23) \[\text{[CP}_2 \text{ Wovon}_i \text{ [C'} \text{ glaubst du [CP}_1 \text{ (t)}_i \text{ [C} \text{ wovon } \text{ sie } t_i \text{ träumt }]\text{]}]\]

of.what believe you COMP she dreams

On the assumption that complementiser agreement can be triggered by the application of *Agree* alone, *wh*-copying would then provide evidence only for local agreement, but not for successive-cyclic movement.

There are several arguments against an analysis of the copy construction in terms of complementiser agreement, though. For one thing, on the assumption that intermediate copies are *wh*-agreeing variants of the declarative complementiser *dass*, the *wh*-agreement analysis incorrectly predicts that the copy construction and the corresponding *dass* constructions should pattern alike syntactically. Observe, however, that the copy construction but not ordinary long-distance questions exhibits a range of predicate restrictions or 'island effects' that are unexpected under a complementiser-agreement analysis, and also fails to license *wh*-in-situ phrases (the [b] examples below are borrowed from Reis, 2000: 395, and Fanselow & Mahajan, 2000: 219f.).
(24) a. * Wen glaubst du nicht, dass sie liebt?  
who believe you not that she loves  
'Who don't you think that she loves?'

b. * Wen glaubst du nicht, wen sie liebt? (Negative Island)  
who believe you not whom she loves

(25) a. Wen bewies sie, dass Fritz liebt?  
who proved she that F. loves  
'Who did she prove that Fritz loves?'

b. * Wen bewies sie, wen Fritz liebt? (Factive Island)  
who proved she who F. loves

(26) a. Wen hat Peter wann gesagt, dass er besuchen wird?  
who has P. when said that he visit will  
'Who did Peter say when that he is going to visit?'

b. * Wen hat Peter wann gesagt, wen er besuchen wird? (Multiple Wh-Phrases)  
who has P. when said who he visit will
What is more, the \textit{wh}-agreement analysis is unable to account for the fact that intermediate copies and overt complementisers can co-occur in dialects of German in which the 'doubly-filled COMP filter' does not hold (compare also Bayer, 1996: 248n.63):

(27) \textit{Wer} glaubst du, \textit{wer} dass du bist?

who think you who that you are

'Who do you think you are?'

(Fanselow & Mahajan, 2000: 222)

Last but not least, given that complementisers are heads, the \textit{wh}-agreement analysis cannot explain why some speakers also allow for copies of non-head categories to appear at intermediate positions (compare Höhle, 2000: 258n.8, and the examples in [9b] and [10] above). Taken together, these observations indicate that an analysis of the copy construction in terms of \textit{wh}-complementiser agreement is not in fact tenable.

If intermediate copies are not simply complementisers in disguise, then it would appear that they must be either specifiers or adjuncts of non-interrogative C. Nunes (1999) has argued for the latter view, in accordance with his more general claim that PF-copies of moved items are adjoined to functional heads rather than being substituted in specifier positions. The adjoined \textit{wh}-copy and its host will then be subject to a process of morphological reanalysis, which effectively turns the two into a single word. On the assumption that the LCA is blind to the internal structure of words (compare Chomsky, 1995: 337), the LCA will then not be able to 'see' the copy, thus eliminating the linearisation indeterminacy problem noted above. Adjunction of an intermediate \textit{wh}-item to embedded C is illustrated in the (simplified) representation in (28).
Conceivably, head adjunction is motivated by the presence of some 'affixal' feature on a null (or phonetically reduced, as in the Frisian example [1b] above) C head. Notice that besides accounting for the fact that *wh-copying is normally restricted to single words, the head-adjunction analysis also does, in principle, allow for the possibility that a copy and an overt complementiser co-occur, as is the case in (27) above. A potential problem with this proposal for the construction under investigation, though, is that on the assumption that excorporation is barred by a constraint against affix stranding (Lasnik, 1981), it should be impossible for a head-adjoined *wh-copy to undergo any further movement. A possible way around this would be to assume that *wh-copies are in fact base-adjoined to intermediate C heads, while the 'real' *wh-phrase undergoes acyclic movement to its checking position in the matrix clause. It is difficult, however, to think of any plausible formal motivation for adjoining extra *wh-pronouns to non-interrogative heads, and to explain why these must be phonetically identical to, and interpreted as coreferential with, the real *wh-phrase. Note that *wh-phrases other than the one undergoing long-distance movement are excluded from the left periphery of the embedded clause.

(29)  * Wen glaubst du wann Maria (wen) gesehen hat?

who think you when M. who seen hat

What is more, the observation that in some *wh-copying languages, prepositional phrases can also be copied is difficult to reconcile with an analysis in terms of any form of head-
adjunction, or syntactic incorporation. The preliminary conclusion to draw at this point, then, is that wh-copying does indeed reflect intermediate steps of successive-cyclic wh-movement, and that intermediate wh-copies are located in the specifiers of non-interrogative C heads.

3.4 Evidence for selective Spellout

Observe that under the assumption that the phonetic realisation of the [wh] feature is contingent upon Q-agreement (Chomsky, 2001a), the presence of intermediate wh-copies indicates that at the point at which these copies underwent Spellout, the wh-item's uninterpretable [wh] feature had already been checked, or PF-valued, through Q-agreement with the matrix C. In other words, the wh-copying phenomenon would seem to provide strong evidence for a convergence-based definition of phase, according to which only constituents that do not contain any elements that are still syntactically active, or copies of such elements, may undergo Spellout.

Given that it is the ultimate wh-copy that serves as a 'scope marker' and clausal typer, one might assume that intermediate copies are actually invisible to interpretation (as has been argued for A-chains; see e.g. Hornstein, 1998: 121). There is some evidence from scopal data, however, indicating that intermediate wh-copies are more than just PF reflexes of cyclic movement. Pafel (2000: 340), for instance, observes that wh-copying sentences such as (30a) below readily permit a pair-list reading, with the wh-pronoun wo 'where' having narrow scope with respect to the universal quantifier jeder 'everyone'. He is less certain, on the other hand, as to the availability of a wide scope reading of wo (an intuition that I share - but cf. von Stechow, 2000: 467, for a different view). The ambiguity of the corresponding long-distance wh-question (30b), on the other hand, seems uncontroversial.
(30) a. *Wo glaubt jeder, wo die besten Weine wachsen?*
   where believes everyone where the best wines grow

b. *Wo glaubt jeder, dass die besten Weine wachsen?*
   where believes everyone that the best wines grow

   Both: 'Where does everyone think that the best wines grow?'

By way of accounting for the above contrast, Pafel (2000: 348) proposes a constraint on relative scope determination to the effect that for a *wh-*expression to be able to outscope another quantifier, both the head of the *wh-*chain and the intermediate copy must be able to take scope over that quantifier.

Another interpretive difference between long-distance *dass* questions and the copy construction has been pointed out by Reis (2000). She observes that whereas long-distance *dass* questions such as (31a) below that contain an inconsistent proposition are ambiguous between an inconsistent and a consistent reading, the corresponding *wh-*copying structure (31b) patterns with simple *wh-*interrogatives such as (31c) in that it allows for an inconsistent reading only (the symbol # is used here to mark inconsistency).\(^{10}\)

(31) a. *Wo glaubt sie, dass Fox populärer ist als er ist?*
   where believes she that F. more.popular is than he is?
   'Where does she believe that Fox is more popular than he is?'
b. #Wo glaubt sie, wo Fox populärer ist als er ist?
   where believes she where F. more.popular is than he is?

c. #Wo is Fox populärer als er ist?
   where is F. more.popular than he is?

The contrast between (31a) and (31b) would seem to support Pafel's intuition that the lower rather than the higher wh-copy matters for certain interpretive purposes.

To the extent that the interpretive differences between long-distance wh-interrogatives and the copy construction noted above are real, they suggest that intermediate wh-copies remain visible to semantic interpretation. If, however, intermediate wh-copies are also included in LF representations, then how come the use of the wh-copying strategy does not cause problems for Full Interpretation, or at least give rise to an interpretive dilemma? The apparently paradoxical situation that in complex wh-interrogatives, the wh-pronoun can be semantically interpreted at a non-operator position can plausibly be accounted for by certain special properties of wh-pronouns in languages like German. Note that from a semantic point of view, wh-expressions consist of two parts, a wh- or operator part, and an indefinite or 'core' part (Katz & Postal, 1964, Bayer, 1996, among others).

(32) wer, was, wo .... --> [Q_{wh}] + 'somebody', 'something', 'somewhere'...

Based on the observation that in German, wh-pronouns can also be used as non-interrogative indefinites, some authors have suggested that under certain conditions, these two
parts can be spelled out independently (compare Cheng, 2000). If this is correct, then the copy strategy might provide a means for selectively spelling out (or rather, selectively deleting) the two parts of a *wh*-expression along the lines illustrated in (33) below.\textsuperscript{11}

\begin{equation}
\begin{array}{c}
(33) \quad [\text{CP}_2 \ [ \ Q_{\text{wh}} \ \text{something} ] \ \ldots \ \ [\text{CP}_1 \ [ \ Q_{\text{wh}} \ \text{SOMETHING} ] \ \ldots \ ]]
\end{array}
\end{equation}

Individual languages vary as to whether or not they allow for *wh*-expressions to be split up into their constitutive parts. As for German, the possibility of *was-für* split and other types of separation construction provides independent evidence that the language does indeed permit this option (see, for instance, Pesetsky, 2000: 67-69).\textsuperscript{12}

\begin{equation}
\begin{array}{c}
(34) \quad \text{a. } \text{*Was für Bücher* hast du gekauft?}
\text{what for books have you bought}
\end{array}
\end{equation}

\begin{equation}
\begin{array}{c}
(34) \quad \text{b. } \text{*Was hast du für Bücher* gekauft?}
\text{what have you for books bought}
\end{array}
\end{equation}

Both: 'What kind of books did you buy?'

Notice that if the above suggestion is along the right lines, it provides a natural account for Pafel's (2000) observation that the presence of a copy in the lower clause can prevent a moved *wh*-expression from outscoping a quantifier in the matrix clause. As the two *wh*-copies are part of a single but discontinuous *wh*-expression, for the *wh*-expression to take scope over another quantifier, both of its parts must do so.
Visible evidence for selective Spellout comes from *wh*-movement in Afrikaans, where a preposition can optionally be stranded at an intermediate (Spec,CP) position, as in (35c) below (Du Plessis, 1977: 724).

\[(35)\]  
\[a.\] \textit{Waarvoor} dink julle werk ons?  
wherefore think you work we  

\[b.\] \textit{Waar} dink julle werk ons \textit{voor}?  
where think you work we for  

c. \textit{Waar} dink julle \textit{voor} werk ons?  
where think you for work we  

The use of \textit{voor} instead of \textit{vir} 'for' in (35c) indicates that the stranded preposition is part of the compound *wh*-pronoun \textit{waarvoor} rather than a free preposition as in PPs like \textit{vir wat} 'for what'. Contrary to bound \textit{voor}, the morphologically independent preposition \textit{vir} cannot in fact be stranded (cf. ibid.).

\[(36)\]  
\[a.\] \textit{Waar/wat} werk ons nou eintlik \textit{voor}?  
where/what work we now actually for  

\[b.\] * \textit{Waar/wat} werk ons nou eintlik \textit{vir}?  
where/what work we now actually for
Given that the stranded prepositional element in (36c) is a bound morpheme, an analysis in terms of base adjunction of voor to some projection of embedded C (along the lines suggested by Radford, 2001, for floating quantifiers in Irish) does not seem a feasible alternative.

An analysis of wh-copying in terms of the discontinuous spelling-out of a moved wh-expression is further supported by certain observations regarding CP-coordination in German. While it is possible for either two dass 'that' clauses or two clauses containing wh-copies to be conjoined, only the latter option seems to permit (and perhaps even favour) a reading according to which wen 'who' refers to two different individuals (i.e., $wen_j \neq wen_k$ in [37b]).

(37) a. $Wen$ glaubst du, $[CP$ dass sie getroffen hat $]$ und $[CP$ dass sie liebt $]$?

who think you that she met has and that she loves

'Who do you think that she met and that she loves?'

b. $Wen$ glaubst du, $[CP wen_j$ sie getroffen hat $]$ und $[CP wen_k$ sie liebt $]$?

who think you who she met has and who she loves

On the assumption that ATB extraction must target identical material within both conjuncts, this interpretive contrast indicates that the specifier of the matrix C hosts only the (identical) operator parts of the two lower wh-copies in (37b), while their (potentially distinct) core parts are interpreted within the lower clauses. Ordinary ATB extraction as in (37a), on the other hand, affects the entire wh-expression, which makes computing a disjoint reading difficult or impossible.
Interestingly, assuming that *wh*-copying involves the separation of the *wh*-part from its (indefinite) restriction might also help account for the island effects notes earlier. Specifically, the possibility of quantifiers or other sentence operators intervening between two copies may be ruled out by the following general condition barring operator 'intervention effects' that has been proposed by Pesetsky (2000) (compare also Höhle, 2000: 262f., and references cited there):

(38) *Intervention Effect:*

A semantic restriction on a quantifier (including *wh*) may not be separated from that quantifier by a scope-bearing element.

Pesetsky (2000: 67)

Under this view, restrictions on *wh*-copying such as the negative island effect illustrated by (24b) above, or the restriction on multiple *wh*-phrases exemplified by (26b), would result from a violation of condition (38) - the same condition that renders bad the French separation example in (39b) below, which involves sentential negation, and the German examples in (40b) & (41b).

(39) a. *Combien* a-t-il conduit *de véhicules* ?

*how many* did he *drive* *of cars*

'How many cars did he drive?

b. *Combien* n'a-t-il pas conduit *de véhicules* ?

*how many* did he *not drive* *of cars*

Intended: 'How many cars didn't he drive?'
(40) a. *Was hat Karla für Bücher gelesen?*
\[\text{what has K. for books read}\]
'What (kind of) books has Karla read?'

b. *Was hat niemand für Bücher gelesen?*
\[\text{what has nobody for books read}\]

(Höhle, 2000: 263)

(41) a. *Was für Radios hast du wie repariert?*
\[\text{what for radios have you how fixed}\]
'What (kind of) radios did you fix how?'

b. *Was hast du (*wie) für Radios repariert?*
\[\text{what have you how for radios fixed}\]

(Haider, 2000: 233)

In sum, the above observations indicate lower copies of long-distance extracted \textit{wh}-expressions do indeed reflect intermediate stages of successive-cyclic movement, and that they are located in intermediate CP-specifier positions rather than being syntactically incorporated by (null) C. What is more, there is some indication that intermediate copies of a long-distance extracted \textit{wh}-phrase matter for relative scope determination. I have argued that these and other
observations are best accounted for by an analysis of \textit{wh}-copying in terms of the discontinuous spelling-out of a \textit{wh}-expression's operator part and its indefinite or core part. That is to say, while being homophonous with the copy that appears in the matrix clause, lower \textit{wh}-copies carry different \textit{interpretable} features from the ultimate copy. If multiple \textit{wh}-copies are actually non-identical in the sense just described, then their presence does not pose a problem for \textbf{Full Interpretation}. On the assumption that only the highest copy will in fact keep the \textit{interpretable} interrogative feature that matches that of the matrix C head (i.e., its operator or \([Q]\) feature), the presence of more than one \textit{non}-operator copy at intermediate positions in multiple embedding structures does not violate \textbf{Full Interpretation}, either. For illustration, consider how a multi-clausal sentence such as (12) above might be derived (note that possible additional steps targeting intermediate [Spec,\(vP\)] positions have been omitted for simplicity's sake; cf. note 6).\textsuperscript{13}
The direct object *wh*-pronoun *wen* 'who' undergoes successive-cyclic raising to the matrix clause, where its uninterpretable [wh] feature is eventually assigned a PF-value through agreement with C. After all uninterpretable features have been eliminated from the representation, as indicated in (43) below, Spellout will apply and transfer the entire (and by now, convergent) phrase marker to the phonological and interpretive systems. Intermediate copies of *wen* will be pronounced under certain conditions only (see section 3.5 below for details), or else will be silent.

(43) $\left[ \text{CP}3 \ 	ext{WEN} \ [C' \text{ glaubst } ] \ du \ \ldots \ \left[ \text{CP}2 \ 	ext{WEN} \ [C' \emptyset ] \right. \right.$ Peter meint

who believe you who P. thinks

$\left. \left[ \text{CP}1 \ 	ext{WEN} \ [C' \emptyset ] \ 	ext{Susi} \ 	ext{wen} \text{ heiratet } ]] \right] \right.$

who S. who marries

$\left. \left[ \text{CP}1 \ 	ext{WEN} \ [C' \emptyset ] \ 	ext{Susi} \ 	ext{wen} \text{ heiratet } ]] \right] \right.$

$\left. \left[ \text{CP}1 \ 	ext{WEN} \ [C' \emptyset ] \ 	ext{Susi} \ 	ext{wen} \text{ heiratet } ]] \right] \right.$

Observe that in (43), only one of the *wh*-copies present - the one in the specifier of matrix C - will be interpreted as an interrogative operator. As to the lower copies, none of these carry any syntactic features that are uninterpretable, or features which conflict with the feature specification of the intermediate (declarative) C heads. I further assume that the remaining semantic features of all but one of the lower *wh*-copies must ultimately be deleted from the LF representation as well, so as to ensure that the sentence can be assigned a coherent interpretation.
as a whole. The requirement that redundant chain links must eventually be deleted is by no means specific to the copy construction, though (compare e.g. Hornstein, 1995).

Note that the above analysis predicts that negative (and other) operators should be barred from intervening between the highest and the penultimate copy of *wen* only, but not necessarily from intervening between two lower copies. As the following example shows, this prediction does indeed appear to be borne out.

(44)  *Wen glaubst du (*nicht), wen Peter (?nicht) meint, wen Susi (nicht) heiratet?*

who believe you not who P. not thinks who S. not marries

While the presence of multiple *wh*-copies, under the analysis outlined above, does not violate Full Interpretation, the possibility of recursive *wh*-copying does, however, seem to present a problem for the LCA - unless the LCA is assumed to apply cyclically (as has been suggested by Uriagereka, 1999), and irrespectively of LF-convergence. I will return to this issue in section 4.2 below.

3.5  *What permits wh-copying?*

The fact that *wh*-copying is restricted to (a subset of) declarative-taking verbs indicates that for the copy strategy to be available, the complement clause *must* be headed by non-interrogative C. Setting aside, for the moment, the more general question of how *wh*-movement to the specifiers of intermediate non-interrogative heads is formally triggered (an issue that will be addressed briefly in section 4 below), another question that has not yet been addressed is what
grammatical property or properties of *wh*-copying languages should permit - or possibly, force - the *spelling-out* of multiple copies of a moved *wh*-item under certain conditions.

McDaniel et al. (1995) propose a unified analysis of medial *wh* in English child language and *wh*-copying in languages like German and Romani in terms of underspecification. Specifically, they argue that grammars that permit *wh*-copying lack the \(\pm\text{pred(icate)}\) feature which according to Rizzi's (1990) feature system distinguishes relative clauses from declaratives and questions in the adult language. The spelling-out of intermediate copies is permitted in this case because the specifier of a C-head that is not specified for the feature [pred] at all is capable, in principle, of hosting a *wh*-expression (McDaniel et al., 1995: 736).¹⁴ Among the objections that can be raised against McDaniel et al.'s underspecification analysis are the following, though. First, note that it seems intuitively rather implausible to claim that in languages like German or Romani, no distinction is made between relative clauses (which are semantically construed as predicates) and declarative complement clauses (which are argumental). Secondly, it is unclear to what extent a CP that is not clearly specified as declarative is capable of meeting the selectional requirements of the (subset of) declarative-taking verbs that permit *wh*-copying. If anything, the underspecification analysis would seem to predict that *wh*-copying should be *less* restricted than ordinary long-distance extraction - whereas in fact the opposite seems to be true (cf. the various types of 'island effect' noted earlier). The underspecification hypothesis moreover makes the incorrect prediction that German relative clauses can optionally be headed by the declarative complementiser *dass* 'that':
(45)  a.  Ich kenne den Mann, der hier wohnt.
    I know the man who here lives
    'I know the man who lives here.'

                      b.* Ich kenne den Mann, (der) dass hier wohnt.
                      I know the man (who) that here lives

Third, as the authors point out themselves, their assumption that children's initial grammars lack the [pred] feature is potentially problematic from a learnability perspective: If grammars that allow wh-copying are 'smaller' than grammars that do not, then what property or properties of the input tells (e.g.) English-speaking children that their target grammar disallows wh-copying? Finally, note that McDaniel et al.'s underspecification account is difficult to reconcile with the minimalist assumption that overt movement applies only as a last resort, to save a derivation that would otherwise be doomed to failure.

What property of wh-raising languages like German might require that intermediate copies be phonetically realised under certain conditions? Cross-linguistically, only one copy of a non-trivial chain will normally be pronounced, which ensures that the relationship between surface form and semantic interpretation is made as transparent as possible. Pronouncing more than one copy (notably, in the shape of a resumptive pronoun) has been argued to be possible only to save an otherwise non-convergent derivation (compare e.g. Hornstein, 2000: 177f., or Pesetsky, 1997). Recall that in the absence of an overt complementiser, the pronunciation of intermediate wh-copies is indeed obligatory in German, and that in standard varieties of the language, intermediate copies and complementisers are mutually exclusive. This indicates that German is subject to a
requirement to the effect that either the head or the specifier of an embedded CP must contain phonetic material (compare also Fanselow & Mahajan, 2000: 221). In contrast, no such visibility requirement appears to hold for embedded CP in English (cf. the grammaticality of [46b] below):

(46) a. * Wen glaubst du, sie liebt?
   who believe you she loves

   b. Who do you think she loves?

   In German, then, there are (at least) two alternative ways of rendering the embedded CP in long-distance questions PF-visible: by merging an overt complementiser in C as in (45a), or, if the complementiser is phonetically null, by pronouncing the intermediate wh-copy as in (47b).

(47) a. Weni glaubst du [CP ti' [C dass [TP sie ti liebt ]] ]?

   b. Weni glaubst du [CP weni [C Ø [TP sie ti liebt ]] ]?

   The analysis presented thus far leaves open the question of why the copying of full wh-phrases should be prohibited, though. By way of accounting for the observation that wh-copying tends to be confined to single phonological words, Fanselow & Mahajan (2000: 221) suggest an explanation in terms of PF restrictions. They argue that because deletion applies obligatorily to copies of successive-cyclic wh-movement that remain in intermediate specifier positions, the only way for a lower wh-copy to escape deletion is to undergo PF-cliticisation onto C - a possibility that is not normally available for multi-word wh-expressions. Notice, however, that this
generalisation would seem wrongly to rule out examples like (10) from Afrikaans (repeated below for convenience), and fails to explain why many German speakers also accept equivalent sentences in their language.

(10) *Met wie het jy nou weer gesê met wie het Sarie gedog met wie gaan Jan trou?*

'Whom did you say (again) did Sarie think Jan is going to marry?'

Let us therefore explore the alternative possibility (mentioned briefly in section 3.1 above) that the relevant restriction on *wh*-copying is in fact based on the notion of D-linking. It has often been noted that referential or D-linked *wh*-phrases are less sensitive to certain types of island effect than non-D-linked phrases (Cinque, 1990, among others), and that they can cause superiority effects to disappear (Pesetsky, 1987).

(48) a. *Who did Mary wonder whether John had failed?*

b. ? Which student did Mary wonder whether John had failed?

(49) a. *What did who buy?*

b. Which book did which person buy?

Anti-locality effects of the sort illustrated by (48b) and (49b) suggest that D-linked *wh*-phrases differ from non-D-linked ones in that they may undergo non-local movement. This hypothesis is further supported by the lack of local *wh*-agreement effects in questions containing
D-linked *wh*-expressions in Chamorro (Chung, 1994). Note that if D-linked *wh*-expressions may indeed escape successive-cyclic movement, then the behaviour of D-linked phrases would seem to lend further support to the claim that phases are defined in terms of convergence. Returning to the phenomenon under investigation, given the differences in behaviour between D-linked and non-D-linked *wh*-expressions, it is conceivable that the reason why D-linked *wh*-phrases do not appear in the copy construction is simply because they do not move through intermediate positions in the first place. Note that stating the relevant generalisation as to what kind of *wh*-phrases may undergo copying in terms of D-linking rather than in morphophonological terms accounts for the observation that prepositional phrases may also be copied - provided that they are not D-linked.16

3.6 Preliminary summary

Having shown that analyses of *wh*-copying in terms of complementiser agreement or head adjunction are empirically inadequate, I concluded that intermediate *wh*-copies are best analysed as spelled-out traces of successive-cyclic movement. At the same time, though, the observation that the presence of 'active' *wh*-copies in embedded clauses does not cause the derivation to crash was argued to support a convergence-based view of phases, along the lines proposed by Atkinson (2000) and Radford (2001), and contra Chomsky (1998/2000). I further suggested that rather than creating semantically redundant PF-copies of a long-distance extracted *wh*-expression, *wh*-copying might provide a way of selectively spelling out the indefinite or core part of the *wh*-expression at a lower position, whereas the ultimate copy primarily serves the purpose of indicating that the main clause is a *wh*-interrogative. Under this view, some otherwise mysterious restrictions on *wh*-copying can be argued to follow from a constraint against separating a
quantifier from its restriction which according to Pesetsky (2000) holds universally. Finally, I suggested that the observation that \textit{wh}-copying is restricted to non-D-linked \textit{wh}-expressions may follow from the special status of D-linked phrases that allows them to undergo non-local movement.

4. **What triggers intermediate movement steps?**

4.1 **Optional P-features**

Despite a rich body of cross-linguistic evidence (from \textit{wh}-copying and other sources) in favour of successive-cyclic \textit{wh}-movement, the theoretical motivation for intermediate steps in movement is still far from clear. As regards \textit{wh}-copying in German, the assumption that embedded CP must be PF-visible has been argued to account for the spelling out of intermediate \textit{wh}-traces under certain conditions, but does not answer the more fundamental question of what should motivate \textit{wh}-raising to the specifier of a [-Q] head in the first place. Given that according to the Last Resort condition, movement can only apply if it results in feature checking, several authors have proposed that intermediate movement steps are triggered by pseudo-interrogative or other "peripheral" (force, focus, or similar) features in intervening phase heads. Collins (1997), for example, has argued that intermediate movement steps are triggered by uninterpretable, non-interrogative [wh] features (or [Q] features, in Chomsky's, 2000, system) in intermediate C-heads. On the assumption that the spelling-out of a \textit{wh}-feature is a reflex of Q-agreement, the hypothesis that intermediate movement steps are triggered in essentially the same way as is the ultimate step provides a natural explanation for the fact that in languages that exhibit overt reflexes of successive-cyclic \textit{wh}-movement such as complementiser agreement or \textit{wh}-copying, these reflexes usually involve morphological \textit{wh}-marking (compare also McCloskey, 2000a: 8).
It remains unclear, however, how such features should ever come to be associated with non-interrogative heads - or, conversely, why their presence in intermediate C heads does not violate the selectional requirements of the matrix verb. What is more, note that we would normally expect a wh-expression that has entered into a Q-agreement relation with an intermediate C head to become inactive, i.e., unavailable for further movement. As this is clearly not the case (at least not in wh-raising languages), however, it appears that we are dealing with [Q] features that are 'strong' enough to act as probes for agreement, but at the same time, too 'weak' to check the uninterpretable [wh] feature of the goal.

A more feasible alternative to Collins' approach to successive-cyclic wh-movement is the idea that intermediate steps are triggered by features other than those involved in checking a wh-expression's uninterpretable wh-feature. Sabel (2000), for example, has suggested that a [focus] feature may be responsible for triggering local wh-movement to the specifier of non-interrogative heads (a similar suggestion has been made by Cole & Hermon, 2000, for Malay). If this feature is 'strong', as he claims is the case in German, then partial movement (i.e., the spelling-out of wh-expressions in the specifier of non-interrogative C) is possible. If it is 'weak', as in English, partial movement is unavailable. Note, however, that the assumption that embedded declarative C in German generally contains an uninterpretable [focus] feature is problematic because it makes the incorrect prediction that in non-interrogative contexts, other constituents should also undergo focus-movement to local CP-specifier positions. As has been pointed out by Simpson (2000: 176f.), however, nothing except wh-expressions ever seems to appear in embedded (Spec,CP) position in German:
In short, even in a language in which the [focus] feature in C is supposed to be strong in the sense of being able to trigger overt substitution in its specifier, there is no independent evidence that embedded (Spec,CP) is a focus position.

Given that in the absence of a potential checker, the presence of uninterpretable peripheral features in intermediate phase heads would cause the derivation to crash, Chomsky (1998) suggests that movement-triggering features are only optionally added to C or v heads.19

(51) The head H of a phase PH may be assigned an EPP- and P-feature.

(Chomsky, 1998: 23)

Together with movement-inducing EPP features, the presence of uninterpretable P-features in C and v ensure that a wh-item that is active because it (still) contains unchecked features is drawn to the edge of each intermediate phase, and thus remains accessible to further computation. There are, however, reasons for being sceptical about a solution to the triggering problem in terms of optional P-features as well. For one thing, peripheral features - which must be part of the
featural make-up of both intermediate phase heads and a 'matching' wh-expression - do not make any obvious contribution to interpretation, at least not to the interpretation of the clause within which they are checked (compare McCloskey, 2000a: 6). If anything, as McCloskey points out, the presence of such features in intermediate phase heads renders the mapping from syntax to semantics unnecessarily complicated. Moreover, note that the hypothesis that EPP or P-features are present only when needed (that is, to trigger intermediate movement steps) appears to describe, rather than derive, successive-cyclic movement. In short, in view of the fact that in there is no independent motivation for the presence of uninterpretable peripheral or EPP features in intermediate phase heads in long-distance questions, the suggestion that such features can optionally be added to C or v before a phase is completed ultimately fails to offer a satisfactory solution to the triggering problem as well.

4.2 Non-feature-driven movement

Given that the presence of pseudo-interrogative or other peripheral features in intermediate phase heads is difficult to justify empirically, let us consider the alternative possibility that intermediate steps in movement are indirectly feature-driven only. A suggestion to this effect has been made by Heck & Müller (2000) as part of an optimality-theoretic approach to long-distance wh-raising. They propose that rather than being triggered by uninterpretable P-features of local C heads, intermediate movement steps serve to satisfy a condition dubbed Phase Balance (PB).
Phase Balance:

Phases must be balanced: If P is a phase candidate, then for every feature F in the numeration there must be a distinct potentially available checker for F.

(Heck & Müller, 2000: 104)

On the assumption that material on the left edge of a phase will remain accessible to further computation after that phase has undergone Spellout, PB forces a wh-expression capable of checking uninterpretable features of some higher head to move to the edge of each current phase. As in Heck & Müller's model the PB constraint on phases is ranked higher than the Last Resort condition, derivations involving movement steps that are not feature-driven may still converge. Other things being equal, a PB-type account of successive-cyclic movement is superior to feature-driven accounts in that it renders unnecessary the awkward step of adding uninterpretable, movement-triggering features to phasal heads and wh-expressions on an ad hoc basis. Note, however, that as it stands, the PB presupposes that at any stage during the derivation, the computation has access to the complete numeration (Heck & Müller, 2000: 104). The assumption of this type of 'lookahead' is incompatible with Chomsky's (2000) proposal that each phase is constructed from a lexical subarray containing a single C or v only, though, and would seem to run counter to the idea of reducing operative complexity that helped motivate the introduction of phases to begin with.20

Thus if we want to maintain the assumption that no lookahead is available beyond the local numeration, then it would appear that spellout-phases must be defined in terms of convergence. This is because in the absence of any lookahead, there would be no way for an active wh-item within the current phase to anticipate whether its uninterpretable features will be checked by
some element to be added several cycles later, thus allowing a phase containing such a wh-item to be spelled out locally. This conclusion does, however, throw us back to stage one with respect to the question of how to account for successive-cyclic movement (as the PB account will no longer work). A possible modification of the idea that Spellout should generally be dependent upon convergence, then, might involve assuming that PF-Spellout and LF-Spellout do not necessarily apply at the same points during the derivation. That is, while LF-Spellout may indeed be restricted to phase candidates that are convergent, PF-Spellout may apply automatically to partial phrase markers that form relatively independent phonological or processing units ('PF-phases'). As long as locally uninterpretable, or unvalued, copies of moved wh-expressions are not in fact phonetically realised - which is the case in ordinary long-distance extraction - a given PF-phase will not violate Full Interpretation as far as the phonological component is concerned. Cyclic LF-Spellout, in contrast, would give rise to locally uninterpretable representations as long as the wh-expression is still syntactically active, and because the lower wh-copies' interrogative operator features would clash with those of intermediate declarative C heads (compare e.g. Rizzi's, 1990 Wh-Criterion). Following Chomsky (1998, and later), the only way for an as yet unvalued wh-expression to escape 'premature' Spellout (= PF-Spellout, under the present scenario) is by moving to the edge of each local phase before that phase is spelled out. Successive-cyclic wh-movement, under this view, would be motivated solely by PF-considerations - the requirement that for a wh-expression to be pronounced, its uninterpretable [wh] feature must have been checked, or valued, through [Q] agreement with a matching C-head - rather than being triggered by (optionally added) uninterpretable features of intermediate phase heads.21

To return to the construction under investigation, if we assume that PF-Spellout applies automatically to local CPs (and possibly, vPs) and irrespective of LF-convergence, then copies of
an active \textit{wh}-expression at the edge of intermediate PF-phases will be pronounced only if (i) PF-
visibility (or similar) requirements license the spelling-out of such copies, and (ii) their phonetic
realisation is not in fact contingent upon [Q] agreement with the matrix C. Condition (i) accounts
for the fact that overt intermediate copies do not normally co-occur with overt complementisers
(compare section 3.5 above), while condition (ii) effectively restricts \textit{wh}-copying to languages
that permit the splitting-up of a \textit{wh}-expression's operator and core parts, thus allowing for the \textit{wh}-
expression's indefinite part to be spelled out in its own right, and its (homophonous) operator part
to end up in the specifier of the highest C head. Observe further that on the assumption that the
LCA applies to PF-phases only, the presence of more than one non-operator copy of a moved \textit{wh}-
expression will not give rise to the global linearisation problem noted earlier, because once a PF-
phase has been linearised, phase-internal c-command relations do no longer obtain.

The scenario sketched above is highly speculative, of course, and obviously in need of a
much more thorough theoretical and empirical evaluation - which is well beyond the aims and
scope of the present paper, though. It also comes at the cost, by assuming two independent
Spellout-mechanisms rather than just one. Note, however, that the assumption of two kinds of
phase, an LF-phase and a PF-phase, captures the (independently motivated) hypothesis that
agreement but not movement may be acyclic (see Pesetsky, 2000).

5. \textbf{Concluding remarks}

I started out by drawing attention to some problems for successive-cyclic \textit{wh}-movement
that arise from Chomsky's (1998, and later) phase-based theory of structure-building. A possible
alternative to successive-cyclic movement suggested by Radford (2001) to the effect that long \textit{wh}-
movement generally proceeds in a single step was rejected on the grounds that it is unable to
account for the *wh*-copying phenomenon that is found in languages like German, which was argued to provide strong evidence that long *wh*-raising does indeed proceed in a series of local steps (with the possible exception of D-linked phrases). At the same time, however, the *wh*-copying phenomenon calls into question the idea that Spellout takes place obligatorily at the next higher phase level. That is, the assumption of cyclic Spellout, while ensuring that long-distance A'-movement takes place in successive-cyclic fashion on the one hand, actually appears incompatible with the presence of intermediate *wh*-copies that are still active at the point at which Spellout applies. By way of offering a possible solution to this dilemma, I suggested that phases should best be defined in terms of convergence, with the 'propositional' categories CP and vP being potential candidates for local Spellout only. A possible modification of this proposal that was discussed in the previous section is the idea that whereas LF-Spellout is potentially non-local in that it applies only to phrase-markers that are convergent, PF-linearisation applies obligatorily at the end of each (next higher) candidate phase. Under this view, intermediate movement steps are not in fact feature-driven, but merely help ensure that in *wh*-raising languages, an active *wh*-expression does not undergo PF-Spellout until its uninterpretable [wh] feature has been assigned a PF-value. In *wh*-copying languages like German, certain language-specific properties - including the requirement that embedded CP must be visible, and the (independently attested) possibility to split *wh*-expressions up into an operator and a core part - conspire to allow for intermediate copies to be phonetically realised. While the 'triggering problem' is likely to remain the subject of much theoretical debate for some time to come, I hope to have sketched a possible way of how it might be approached.
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Acknowledgements to be added.

Other standard arguments in support of successive-cyclic *wh*-movement include floating quantifiers in Irish English dialects (McCloskey, 2000b, 2000c), reconstruction effects (Barss, 2001; Fox, 2000), and partial *wh*-movement in a variety of languages including Malay/Bahasa Indonesia (Cole & Hermon, 2000; Saddy, 1991) and Ancash Quechua (Cole, 1982). There is also evidence from experimental psycholinguistic studies suggesting that intermediate *wh*-traces form part of the mental representations of sentences that are constructed during sentence comprehension (Frazier & Clifton, 1989; Gibson & Warren, 2000).

Chomsky (2000: 107ff.) also discusses the possibility that phases are defined in terms of convergence, but rejects it on the grounds that it would render lexical selection less economical, and because it occasionally appears to yield the wrong empirical results. By way of illustrating the latter point, Chomsky observes that if phasehood was dependent upon convergence, then the constituent labelled \( \alpha \) in (i) below would not constitute a phase. Since phases are constructed on the basis of lexical (sub-)arrays, the initial lexical array must be larger than the set of items required for constructing \( \alpha \). If the extended lexical array included expletive *there*, however, then nothing would block 'premature' insertion of the expletive in (Spec,TP) of the lower clause, which would have the undesirable consequence of preventing the subject DP *John* from raising to this position.
(i) Which article is there some hope that John will read t\textsubscript{wh} \\

Note, however, that this problem does not arise under the assumption that \textit{there}-type expletives are quasi-argumental (as has been proposed by Felser & Rupp, 2001), which implies, among other things, that the possibility of merging an expletive is constrained by a predicate's selectional properties.

3 See Postal (1972) for an earlier suggestion to this effect. Within the recent minimalist literature, discussions concerning the elimination of traces have usually focused on A-movement (compare e.g. Chomsky, 1995: 300ff.; Hornstein, 1998; Lasnik, 1999).

4 Except where the \textit{wh}-copying strategy serves to avoid a possible \textit{that}-trace violation (for those speakers of German who are sensitive to \textit{that}-trace effects):

(i) * Wer glaubst du, dass kein Bier mag? \\
    who think you that no beer likes \\

(ii) Wer glaubst du, \textit{wer} kein Bier mag? \\
    who think you who no beer likes \\
    'Who do you think does not like beer?'

5 Höhle (2000: 258), for instance, only assigns a question mark to an example similar to (9b) (his [19e]), a judgement that I am inclined to share; cf. also Höhle's note 8.

6 Contrary to what the extensional definition of phase would seem to predict, there is no evidence that \textit{wh}-copies can appear at intermediate (Spec,\textit{vP}) positions. As the issue of
whether or not vP constitutes a phase is largely irrelevant to the present discussion, though, I shall leave this question open (for some evidence in support of the phasal status of vP, see e.g. Legate, 2001; Nissenbaum, 1998).

Note also that in *wh*-in situ languages like Hindi, the 'scope marker' *kyaa* 'what' in partial movement constructions actually appears in matrix object position (compare e.g. Dayal, 1994).

Observe further that cross-linguistically, *wh*-copying and the partial movement/scope marking construction are dissociated. While some languages that permit *wh*-copying lack the equivalent of the German *was* construction (e.g. French; compare Reis, 2000: 396), other languages permit partial movement but do not show *wh*-copying (e.g. Hindi; see Fanselow & Mahajan, 2000: 196). For more detailed discussions of the partial movement construction in German, the reader is referred to Felser (2001), and to the collection of articles in Lutz, Müller & Stechow (2000).

According to some authors, volitional predicates also give rise to island effects, as illustrated by (i) below (example from Fanselow & Mahajan, 2000: 220).

(i)  *Wen* möchtest du, *wen* sie liebt?

who want you who she loves

Individual speakers' sensitivity to such island effects appears to vary, though. Simpson (2000: 163n.12), for example, cites the following example involving a volitional predicate as fully grammatical:
(ii) *Wen willst du, wen Jakob besticht?*

whom want you whom J. bribes

'Who do you want Jakob to bribe?'

The consistent reading requires that the inconsistent object of attitude be attributable to two different sources capable of believing, and can be paraphrased roughly as follows: "For which place X, in her belief worlds is Fox more popular at X than Fox is popular at X in the real world" (compare Stechow, 2000: 468).

See Hiemstra (1986) for a pre-minimalist analysis of *wh*-copying in Frisian in terms of selective feature movement. A suggestion to the effect that in languages like German, a *wh*-expression's operator feature can raise independently of its core part has also been made by Cheng (2000) as part of a 'direct dependency' analysis of the *was...w* (or 'scope-marking') construction. While Cheng does not discuss the copy construction at all, given her assumption that an operator feature that is separated from the core *wh*-phrase is invariably spelled out as *was* 'what' in German, and the fact that the *was...w* construction and the copy construction do not pattern alike (see section 3.2), it appears that an analysis in terms of selective feature movement, or scattered Spellout, cannot be correct for both the scope marking and the copy construction at the same time.

As has been noted by Cheng (2000: 96), however, relating the availability of partial *wh*-movement to morphological properties of *wh*-pronouns in a given language (i.e., whether or not they can also be used as indefinites) seems problematic in view of the observation
that Frisian, for example, appears to lack the indefinite use of wh-pronouns. I therefore suggest that the availability of wh-separation constructions in a language might provide a more reliable clue as to whether or not that language also permits wh-copying. Clearly, the validity of this generalisation needs to be tested by further cross-linguistic investigation, though.

Whether or not the copy at the head of the chain initially carries the wh-expression's indefinite or 'core' part along depends on whether or not one allows for selective feature movement to occur (compare Chomsky, 1995, versus Chomsky, 1998, and later). An anonymous reviewer points out that if the Intervention Effect is taken to be a condition on LF representations (as stated in Pesetsky, 2000: 110n.80) rather than a condition on computations, then given the minimalist assumption that the non-operator part of all moved wh-expressions will normally reconstruct (the 'Preference Principle'; cf. Chomsky, 1995: 209), the question arises as to why ordinary wh-movement should be able to escape the Intervention Effect. I do not think that this objection to Pesetsky's condition is in fact valid, though, as the Preference Principle merely states that reconstruction will apply when it can (Chomsky, 1995: *ibid*). As has been noted by Cinque (1990), Rizzi (1990), among others, wh-phrases extracted from wh-islands, for example, do not normally reconstruct. Whereas (i) below is ambiguous between a question about someone's publishing goals (the amount quantification or 'non-referential' reading), and a question about the cardinality of a set of existing books (the 'referential' reading), example (ii) permits the latter interpretation only (examples from Heycock, 1995: 562).
How many books did she decide to publish this year?

How many books did she wonder whether to publish this year?

On the assumption that the non-referential reading corresponds to an LF representation that involves reconstruction of the wh-expression's indefinite or core part (see e.g. Heycock, 1995), the absence of such a reading in (ii) above is accounted for by the Intervention Effect, if this is taken to be an LF condition that affects reconstruction, as Pesetsky claims.

McDaniel et al.'s account diverges from Rizzi's (1990) original feature system in that it assumes that both relative clauses and embedded declaratives are headed by [-wh] C, and that a wh-phrase may appear in the specifier of non-interrogative C if the wh-phrase is A'-bound (McDaniel et al., 1995: 734).

Moving the finite verb to C might provide a third way of satisfying the requirement that embedded declarative CP must be overtly marked:

(i) Wovon glaubst du träumt sie t₁ ?
   of.what believe you dreams she

As it is not entirely clear, though, whether what appears to be extraction from V2 clauses involves genuine embedding, or parenthesis (as has been argued e.g. by Reis, 2000), this possibility will not be discussed any further here.

Given my analysis of wh-copying in terms of selective Spellout, we would in fact expect D-linked, or full wh-phrases generally, to undergo discontinuous PF-Spellout rather than
full phonological copying, as they do in other types of separation construction such as (i) below (an option not normally available for pronominal \textit{wh}-expressions).

(i) \textit{Wen} hast du \textit{alles} gesehen?

who have you all seen

'Who all did you see?'

(ii) * \textit{Wen} glaubt Hans \textit{alles} du gesehen hast?

who believes H. all you seen have

As the ill-formedness of (ii) shows, however, remnants of full \textit{wh}-phrases cannot be stranded at the left periphery of embedded clauses, either, at least not in German - but compare the Afrikaans example (35c) in the text, which illustrates such discontinuous PF-Spellout of a non-D-linked \textit{wh}-expression. Of course, the suggestion that D-linked \textit{wh}-phrases are excluded from the copy construction is nothing more than a descriptive generalisation at present (at best). Exactly why referential or D-linked \textit{wh}-expressions should be able to escape successive-cyclic movement is still not entirely clear (see Chung, 1994, for a possible semantics-based account). It is conceivable that phonological factors are also partly responsible for the virtual absence of (remnants of) full \textit{wh}-phrases from intermediate (Spec,CP) positions, in that PF-economy considerations may favour the spelling-out of phonologically 'heavy' material at non-derived positions, in separation constructions. This would account for the relative acceptability of \textit{wh}-copying sentences such as (iii) below, which contains a stranded quantifier (and which I think favours a non-referential reading).
(iii) "Wen glaubt, Hans *wen du alles gesehen hast?"

Who believes H. who you all seen have

'Who all does Hans think that you saw?'

17 McCloskey (2000a: 31) suggests that the (temporary) presence of pseudo-wh features in intermediate C does not conflict with selectional requirements of the matrix verb because these features will be checked and deleted before the matrix clause is constructed. Note, however, that under the assumption of cyclic Spellout, deleted features will in fact remain visible until the end of the next highest phase, which invalidates McCloskey's argument.

18 In the framework outlined by Chomsky's (1998, and later), the strength metaphor is replaced by the presence versus absence of EPP features in agreement-triggering heads.

19 In Chomsky (2000: 109), condition (51) appears in a slightly modified form making reference to EPP features only. The accompanying note 50 (p. 144), however, suggests that he makes no principled distinction between EPP and 'peripheral' features here.

20 Put differently, the PB in its current formulation implies a distinction between two different types of 'phase', a (potentially very large) lexical selection phase, or numeration, and a (locally bounded) derivational phase. A conceptually simpler alternative might be to think of phases are derivational units only, and to allow for the computational system to have continuous access to the lexicon (as has previously been argued, among others, by Collins, 1997, and Frampton & Gutmann, 1999).
The suggestion that PF-Spellout may precede LF-Spellout is reminiscent of earlier versions of Minimalism (Chomsky, 1995). Note that the idea that movement need not be feature-driven appears to be compatible with Chomsky's (2001b) suggestion that movement, conceived of as 'internal Merge', is in fact freely available (see, in particular, his note 29).